635 Modoc
RMO

Extra Copy

UNITED STATES DEPARTMENT OF AGRICULTURE
AGRICULTURAL RESEARCH ADMINISTRATION
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
FOREST INSECT INVESTIGATIONS

Project | Date December 1, 1948 | Author

SUBJECT—

TITLE

FOREST INSECT SURVEY
MODOC NATIONAL FOREST, CALIFORNIA, AND ADJACENT PRIVATE LANDS
SEASON OF 1948

by

J. W. Bongberg

National FS Library
USDA Forest Service

MAR 24 2014

240 W Prospect Rd
Fort Collins CO 80526

Annex I
SB
763
C2 MC
1948
C.2

Forest Insect Laboratory
29 Forestry Bldg., U. C.
Berkeley 4, California

INDEX NO.—

U. S. GOVERNMENT PRINTING OFFICE 16—47272-1

U. S. DEPARTMENT OF AGRICULTURE
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
FOREST INSECT INVESTIGATIONS

FOREST INSECT SURVEY
MODOC NATIONAL FOREST, CALIFORNIA, AND ADJACENT PRIVATE LANDS
SEASON OF 1946

Approved by:

F. P. Keen
Entomologist, in Charge

Submitted by:

J. W. Bongberg
Entomologist

Forest Insect Laboratory
29 Forestry Bldg., U. C.
Berkeley 4, California

FOREST INSECT SURVEY

MODOC NATIONAL FOREST, CALIFORNIA, AND ADJACENT PRIVATE LANDS

SEASON OF 1948

FIELD EXAMINATION

Personnel: Edwin C. Clark, Leslie G. Smith, Arthur H. Retan, Dale C. Prentice, H. Parker Spalding, and J. W. Bongberg, Forest Insect Laboratory, Bureau of Entomology and Plant Quarantine, 29 Forestry Building, University of California, Berkeley 4, California.

Date: July 21 - 29, 1948; August 15 - 16, 1948.

Methods: Ground cruise of permanent sample plots and roadside sample strips.

AREAS EXAMINED

Modoc National Forest and adjacent private timberlands, subdivided into entomological reporting units as shown on the appended map.

IMPORTANT FOREST INSECT PROBLEMS REVEALED BY THE SURVEY

The drain in timber resources as a result of attack by bark beetles is at a low level. This low endemic rate of loss is scattered throughout the National Forest and in adjacent private lands, chiefly in virgin areas and to a lesser degree in the cut-over reserve.

INSECTS RESPONSIBLE FOR PINE DAMAGE IN 1947 and 1948

The western pine beetle, Dendroctonus brevicomis Lec., the California flat-head borer, Melanophila californica Van Dyke, and the mountain pine beetle, Dendroctonus monticolae Hopk. in ponderosa pine; and the Jeffrey pine beetle, Dendroctonus jeffreyi Hopk., in Jeffrey pine.

CHARACTER OF 1947 AND 1948 INFESTATIONS

The bark-beetle infestation during 1947 was found to be of a low endemic character throughout all timbered areas. The trees which were selected and killed by the beetles were scattered throughout the stands. No group loss was encountered. Most of the infested trees were mature or overmature and of a high risk or decadent type. In comparison to the infestation during 1946, there was a seasonal decrease in loss of 9.2 percent during 1947. The annual survey during 1948 was made before the current infestation was far advanced and as a result only a partial appraisal of loss could be made by evidence of faded trees. However, from the partial records obtained, it is not expected that the total loss for 1948 will differ materially from the infestation in 1947.

TREND OF BARK-BEETLE INFESTATIONS

For the past several years, bark-beetle infestations have been at a low level, fluctuating annually by only a few board feet per acre. This downward trend in loss followed the epidemic infestations of 1932 - 1934 and reached an all-time low in 1944. Since 1942 the level of loss has not been above 50 board feet per acre or 0.5 percent of the total green-stand volume. At present there are many high risk trees in the stand that are capable of supporting and producing large populations of bark beetles. However, it is not expected that any sudden upward trend of loss will occur in the immediate future.

INSECT DAMAGE ON SAMPLE PLOTS IN 1947

Each tree which is attacked and killed by bark beetles on the several plots used in sampling timber loss throughout the National Forest is measured and recorded annually. A summary of the number of trees, the board-foot volume, and percent of stand killed by bark beetles on these sample plots during 1947 is given in Table 1. As indicated by the Table, the rate of loss on all areas sampled was of a uniform nature. Loss in Jeffrey pine was exceptionally light in the Adin Area where this tree species constitutes a major portion of the pine stand.

ESTIMATED BARK-BEETLE DAMAGE IN VIRGIN PINE STANDS DURING 1947

It is estimated that 10,292,000 board feet of pine timber was killed in virgin stands on the Modoc National Forest and adjacent private lands during 1947. This estimate was obtained by expanding the per-acre loss measured on the various sample plots to the remaining virgin acreage on the Forest. A distribution of the total loss on the entomological reporting units is given in Table 2.

BARK-BEETLE DAMAGE IN 1948

Since the bark-beetle survey during 1948 was made during the early summer months it is not possible to estimate total loss to be expected for the year. However, since no centers of aggressive pine beetle activity were noted in any area covered, it is not expected that the total seasonal loss in 1948 will differ materially from the 1947 level.

A special effort was made to determine current loss conditions on several entomological units in the Adin Area by additional sampling during late summer. The conditions found were reported by memorandum to the District Forest Ranger at Adin, California, on September 21, 1948[1/]. No centers of aggressive infestations and loss were encountered in this supplemental sampling. However, it was found that current loss in portions of the Stone Coal Unit was higher than in preceeding years and slightly above the records of adjacent stands.

1/ Memorandum to Alex Campbell, District Ranger, Adin, California, from Jack W. Bongberg, Entomologist, Berkeley Laboratory, on "Appraisal of current beetle-caused loss in the pine stands of the Willow Creek, Ash Creek, and Stone Coal Units of the Adin Area, Modoc National Forest, California."

CURRENT BARK-BEETLE DAMAGE IN RESERVE STANDS

For the most part, bark-beetle damage in the cut-over reserve stands is appraised only by general reconnaissance. Certain areas of special interest by reason of cutting methods, however, are sampled by plot measurements. In general, there was no serious damage as a result of bark beetles noted in any of the reserve stands during 1948. Several reserve trees of healthy appearance, however, were attacked and killed in the fringe stands in the Badger Unit despite current cuttings in that area designed specifically to remove high risk and susceptible trees. Other than a post logging disturbance, no explanation can be offered why these trees were attacked and killed.

Roney Flat Cutover: Adin Area. This stand of timber, first cut over on a selective basis during 1940, has been of particular interest since cutting because of an unusually high rate of annual loss. The high level of loss abated in 1947 and it was felt that conditions responsible for this high loss were no longer present. A reversal of this opinion is indicated by the record of loss on a single sample plot during 1948 where bark beetles were responsible for the killing of approximately 30 board feet per acre. This area will bear close watching in the future for possible control action should conditions warrant.

Dutch Flat Cutover: Adin Area. Bark-beetle loss in the Dutch Flat Area during 1947 was higher than would normally be expected in a recently cut stand. This loss was apparently only a result of disturbance in the stand following logging as the area appeared relatively free of infested trees during 1948 when viewed early in August.

Hog Lake Sanitation-salvage Cutting: Happy Camp - Lava Beds Area. One of the first large scale tests of beetle control through the selective removal of high risk trees from the stand was made on the Hog Lake Compartment of the Happy Camp - Lava Beds Area in 1942. Subsequent to this sanitation-salvage cut, a series of sample plots and roadside sample strips were set up in the cut area for the purpose of appraising control benefits. From the time of the cutting, through 1945, beetle loss was measured on 424 acres of roadside sample strips. Since 1946, loss records have been obtained on 595 acres in additional sample plots. Following is a tabulation of the average per-acre loss on this area since cutting and a record of corresponding loss in virgin stands nearby.

	Year of Loss							
	1942	1943	1944	1945	1946	1947	1948*	Total
	(Board feet per acre)							
Hog Lake Sanitation-salvage Cut Area	2.3	0.0	4.4	10.5	0.4	4.6	3.7	25.9
Virgin Stands. Happy Camp - Lava Beds Area	30.0	26.5	25.2	46.2	29.7	23.2	14.5	197.3

*(Partial record only)

The above Table shows a remarkable reduction in loss resulting from the sanitation-salvage cutting. The rate of loss on other areas where all high risk trees have been removed has also been reduced in a like manner. It is felt that the program of sanitation-salvage cutting which is being followed on the Modoc National Forest is responsible in large part for the present low rate of loss on all areas.

INSECT CONTROL RECOMMENDATIONS

No aggressive bark-beetle infestations nor centers of epidemic loss were encountered on the Modoc National Forest and adjacent private timberlands during 1945. As a result, no action is warranted for direct measures of control. Since sanitation-salvage cutting has shown satisfactory benefits in reducing bark-beetle-caused loss, it is urged that this practice be extended into other areas currently in need of protection.

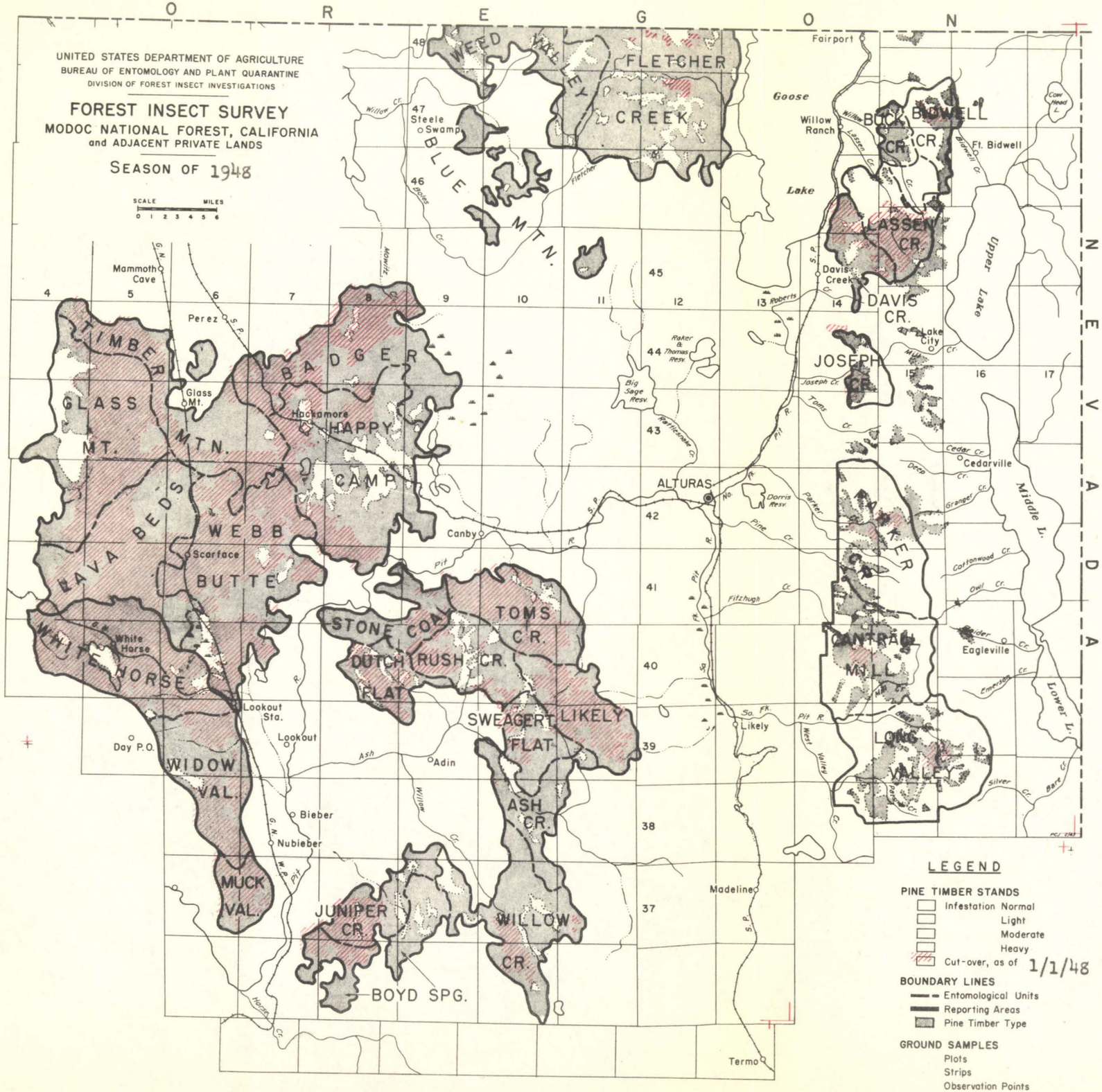
Table 1.--Pine timber killed by bark beetles on virgin sample plots in 1947.
Modoc National Forest, California, and adjacent private lands.

Entomological Unit	Sample Plots: Plot No.	Timbered Acreage	Hazard Rating	Pine Stand: Tree Spp.	Volume M BM	Timber Killed in 1947: No. of Trees	Volume (BM)	Volume per Acre	% of Stand
HAPPY CAMP - LAVA BEDS AREA									
Badger	MC-6	320	IV	PP	3,590	9	10,760	33.6	0.52
	MC-7	300	V	PP	2,490	4	3,710	12.4	0.15
	RD-1	160	V	PP	1,550	1	230	1.4	0.01
	RD-2	160	IV-V	PP	820	0	0	0.0	0.00
	RD-37	160	V	PP	760	1	140	0.9	0.02
Happy Camp	RD-10	160	IV-V	PP	1,850	3	870	5.4	0.05
	Plot 7	160	III-IV	PP	1,700	10	10,420	65.1	0.61
	Plot 8	160	III-IV	PP	1,700	23	14,570	91.1	0.86
Glass Mountain	RD-40	80	III	PP	2,940	3	590	7.4	0.02
				SP	910	none	none	none	none
				Total	3,850	3	590	7.4	0.02
Timber Mountain	RD-39	160	V	PP	360	2	400	2.5	0.11
	AVERAGE OF REPORTING AREA			PP				23.2	0.20
				SP				none	none
				Total				23.2	0.19
DEVILS GARDEN AREA									
Weed Valley	RD-24	160	III	PP	1,750	4	8,320	52.0	0.48
	RD-25	160	III	PP	1,970	10	13,910	86.9	0.71
	RD-27	160	IV	PP	1,430	2	3,290	20.6	0.23
	Sec. 18	640	IV	PP	7,087	22	12,270	19.2	0.17
Fletcher Creek	RD-28	160	III	PP	2,790	1	4,530	28.3	0.16
	RD-29	160	III	PP	3,550	3	10,370	64.8	0.29
	RD-30	160	IV	PP	1,580	none	none	none	none
	RD-34	160	IV	PP	2,040	6	6,930	43.3	0.34
Blue Mountain	RD-26	160	IV	PP	1,710	2	3,740	23.4	0.22
	RD-32	80	IV	PP	480	6	1,920	24.0	0.40
	AVERAGE OF REPORTING AREA			PP				32.6	0.27
ADIN AREA									
Swengert Flat	RD-36	80	III	PP	280	none	none	none	none
				JP	660	none	none	none	none
				Total	940	none	none	none	none
Ash Creek	RD-15	80	IV	PP	380	1	100	1.3	0.03
				JP	130	none	none	none	none
				Total	510	1	100	1.3	0.02
	TR-2	65	IV	PP	253	none	none	none	none
				JP	310	none	none	none	none
				Total	563	none	none	none	none
Willow Creek	RD-16	80	IV	PP	880	4	1,630	20.4	0.19
				JP	330	0	0	0	0.00
				Total	1,210	4	1,630	20.4	0.13
	RD-46	160	IV	PP	420	6	3,080	19.3	0.74
				JP	740	3	1,570	9.8	0.21
				Total	1,160	9	4,650	29.1	0.40
Boyd Springs	RD-19	160	IV	PP	1,790	1	2,230	13.9	0.12
				JP	360	1	1,050	6.6	0.29
				Total	2,150	2	3,280	20.5	0.15
	RD-47	160	IV-V	PP	963	2	2,780	17.4	0.29
				JP	215	1	710	4.4	0.33
				Total	1,178	3	3,490	21.8	0.30
Stone Coal	TR-1	417	IV-V	PP	3,970	18	17,960	43.1	0.45
				JP	853	0	0	0	0.00
				Total	4,823	18	17,960	43.1	0.37
	AVERAGE OF REPORTING AREA			PP				23.1	0.31
				JP				2.8	0.09
				Total				25.9	0.25
MODOC NATIONAL FOREST AND ADJACENT PRIVATE TIMBERLANDS									
AVERAGE OF ALL REPORTING AREAS									
				PP 1/				27.0	0.25
				JP 2/				2.8	0.09

1/ Average of all plots.
2/ Average of plots in Adin Area.

Table 2.--Estimated virgin pine timber killed in 1947 by bark beetles.
Modoc National Forest, California, and adjacent private lands.

ENTOMOLOGICAL UNITS	PINE TYPE ACREAGE (January 1, 1948) Virgin	Cutover	Total	VIRGIN PINE STAND Spp.	M b.m.	PINE TIMBER KILLED IN 1947 No. of Trees	Volume M b.m.	b.m./ac.	% stand
HAPPY CAMP - LAVA BEDS AREA									
Badger	29,230	27,070	56,300	PP	196,250	418	365	12.5	0.19
Happy Camp	36,830	20,210	57,040	PP	404,740	2,762	1,985	53.9	0.49
Webb Butte	9,131	55,999	65,130	PP	162,587	342	101	11.1	0.06
Lava Beds	25,240	30,780	56,020	PP	244,424	644	464	18.4	0.19
Glass Mountain	17,770	41,320	59,090	PP	206,698	1,333	240	13.5	0.11
				SP	37,543	none	none	none	none
Timber Mountain	25,860	23,170	49,030	PP	56,856	323	194	7.5	0.34
AREA TOTALS	144,061	198,549	342,610	PP	1,273,555	5,822	3,349	23.2	0.26
				SP	37,543	none	none	none	none
DEVILS GARDEN AREA									
Weed Valley	24,780	—	24,780	PP	259,870	841	835	33.7	0.32
Fletcher Creek	55,510	1,930	57,440	PP	706,178	1,388	1,477	26.6	0.21
Blue Mountain	13,130	—	13,130	PP	146,898	437	310	23.6	0.21
AREA TOTALS	93,420	1,930	95,350	PP	1,112,946	2,666	2,622	28.0	0.24
ADIN AREA									
Dutch Flat	6,780	7,300	14,080	PP	49,084	141	123	18.1	0.25
				JP	14,079	40	35	5.2	0.25
Stone Coal	18,110	2,830	20,940	PP	101,821	782	780	43.1	0.45
				JP	32,762	none	none	none	none
Toms Creek	8,280	20,900	29,180	PP	93,589	267	233	28.1	0.25
				JP	23,268	48	42	5.1	0.18
Likely	9,580	17,270	26,850	PP	152,044	349	304	31.7	0.20
				JP	49,500	85	74	7.7	0.15
Rush Creek	10,978	7,272	18,250	PP	64,024	184	160	14.6	0.25
				JP	37,556	56	49	4.5	0.13
Swengert Flat	7,192	6,278	13,470	PP	69,676	242	174	24.2	0.25
				JP	39,038	66	48	6.7	0.12
Ash Creek	18,150	720	18,870	PP	74,960	519	227	12.5	0.30
				JP	59,205	141	74	4.1	0.12
Willow Creek	27,837	4,623	32,460	PP	90,854	1,160	546	19.6	0.60
				JP	130,360	348	181	6.5	0.14
Boyd Springs	15,425	5,255	20,680	PP	86,843	145	242	15.7	0.28
				JP	54,265	96	85	5.5	0.16
Juniper Creek	8,530	6,010	14,540	PP	67,720	194	169	19.8	0.25
				JP	12,343	18	16	1.9	0.13
AREA TOTALS	130,862	78,458	209,320	PP	840,615	3,983	2,958	22.6	0.35
				JP	452,196	898	604	2.0	0.13
BIG VALLEY MOUNTAIN AREA									
White Horse	2,803	48,027	50,830	PP	68,345	78	68	24.3	0.10
				SP	36,116	24	36	12.8	0.10
Widow Valley	15,610	16,930	32,540	PP	195,192	391	293	18.8	0.15
				SP	68,353	57	68	4.4	0.10
Buck Valley	3,540	8,030	11,570	PP	3,377	17	12	3.4	0.35
				JP	850	1	1	0.3	0.15
AREA TOTALS	21,953	72,987	94,940	PP	266,914	486	373	17.0	0.14
				SP	104,469	81	104	4.7	0.10
				JP	850	1	1	0.3	0.11
WARNER MOUNTAIN AREA									
Bidwell Creek	4,090	1,270	5,360	PP	28,412	20	14	3.4	0.05
Joseph Creek	1,940	1,600	3,540	PP	17,013	13	9	4.6	0.05
Parker Creek	8,550	1,330	9,880	PP	82,947	59	41	4.8	0.05
				JP	20,539	9	6	0.7	0.03
Centrall Hill	13,620	1,600	15,220	PP	47,455	67	47	3.5	0.10
				JP	85,788	61	43	3.2	0.05
Long Valley	11,960	1,260	13,220	PP	104,895	149	104	8.7	0.10
				JP	34,561	24	17	1.4	0.05
AREA TOTALS	40,160	7,060	47,220	PP	280,722	308	215	5.3	0.08
				JP	140,888	94	66	1.6	0.05
MODOC NATIONAL FOREST AND ADJACENT PRIVATE LANDS									
Total of above five reporting areas.				PP	3,774,752	13,265	9,517	22.1	0.25
				SP	142,012	81	104	2.2	0.07
				JP	593,934	993	671	4.0	0.11
		PP + SP + JP			4,510,698	14,339	10,292	28.3	0.23


OREGON
NEVADA
UNITED STATES DEPARTMENT OF AGRICULTURE
BUREAU OF ENTOMOLOGY AND PLANT QUARANTINE
DIVISION OF FOREST INSECT INVESTIGATIONS
FOREST INSECT SURVEY
MODOC NATIONAL FOREST, CALIFORNIA
and ADJACENT PRIVATE LANDS
SEASON OF 1948
SCALE MILES
0 1 2 3 4 5 6
WEED VALLEY
FLETCHER CREEK
BLUE MTN.
BUCK CR.
BIDWELL CR.
LASSEN CR.
DAVIS CR.
JOSEPH CR.
TIMBER MT.
GLASS MTN.
BADGER FLAT
HAPPY CAMP
LAVA BEDS
WEBB BUTTE
WHITE HORSE
STONE COR.
TOMS CR.
DUTCH FLAT
RUSH CR.
SWEAGERT FLAT
LIKELY
CENTRAL MILL
LONG VALLEY
WIDOW VAL.
MUCK VAL.
ASH CR.
JUNIPER CR.
WILLOW CR.
BOYD SPG.
Fairport
Goose Lake
Willow Ranch
Ft. Bidwell
Davis Creek
Lake City
Cedarville
Eagleville
ALTURAS
Canby
Adin
Likely
Madeline
Termo
Bieber
Nubieber
Lookout
Lookout Sta.
Day P.O.
Mammoth Cave
Glass Mt.
Hackamore
Scarface
White Horse
Steele Swamp
Perez
Upper Lake
Middle L.
Lower L.
LEGEND
PINE TIMBER STANDS
Infestation Normal
Light
Moderate
Heavy
Cut-over, as of 1/1/48
BOUNDARY LINES
Entomological Units
Reporting Areas
Pine Timber Type
GROUND SAMPLES
Plots
Strips
Observation Points